

# Do services reduce gender inequality in labor markets? The service sector, knnowledge-intensive services and the gender pay gap

Diego Dueñas and Carlos Iglesias and Raquel Llorente

Department of Economics. University of Alcalá, Department of Economics and Business Administration. University of Alcalá, Department of Economic Theory. Autonomus University of Madrid

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# DO SERVICES REDUCE GENDER INEQUALITY IN LABOUR MARKETS? THE SERVICE SECTOR, KNOWLEDGE-INTENSIVE SERVICES AND THE GENDER PAY GAP IN SPAIN

**Diego Dueñas Fernández (Universidad de Alcalá e IAES)**

**Carlos Iglesias Fernández (Universidad de Alcalá e IAES)**

**Raquel Llorente Heras (Universidad Autónoma de Madrid e IAES)**

**Abstract:**

The expansion of services and the dissemination of information technologies and communication are identified as important factors that can improve employment opportunities for women, reducing labor by gender differences. The positions of tertiary work, and especially those more related to ICT may be more appropriate for women, in terms of skill requirements, involving related tasks previously performed in the domestic sphere. Both processes would be encouraging a shift in labor demand, basing increased presence of women in the labor market.
The objective of the study is to determine the extent to which services and especially those most closely linked with the knowledge and ICTs such as Knowledge Intensive Services (KIS) are changing some of the basics of labor gender differences. To do it: a) we first measure and characterize employment related with Services and KIS; b) to compare then existing wage differentials in these activities with the observed in the whole economy; c) and conclude whether the Services and / or KIS introduce some significant improvement.
The paper is organized around three blocks analysis. First, measure the wage gap by gender (GSG) in the Services and with focus within the KIS. Second, it will address the explanation of the differential by its decomposition between a traits-related component and an unexplained part that can be associated with some discrimination (Oaxaca-Blinder decomposition). Third, it tries to determine whether the guidelines concluded regarding the GSG are shared by all women or differences in terms of their wage level (quantile decomposition) are observed.

**Key Words**: Gender, Wages, Services, KIS, Oaxaca,Quantiles.

**JCR Codes:** J16, J31, O33

## 1. Introduction.

There has been definitive progress, including in Spain, in reducing gender differences in the labour market. Women have significantly increased their participation rates and employment, substantially reducing labour differences with men. Different factors, such as the effectiveness of antidiscrimination policies, increasing investment in women's education, reductions in fertility rates, the emergence of new technologies related to domestic work and the increase in the supply of part-time work, are typically identified as the basis for this positive trend in female labour activity (Dolado, Felgueroso and Jimeno, 2002). However, within this generally favourable context, it is well known that there is a persistent difference in women and men's salaries, so that women continue to earn less than men for doing the same work.

Specifically, two factors are highlighted for their potential to modify gender differences by improving the opportunities that women traditionally have been able to access. On the one hand, there has been an expansion of work linked to the service sector. On the other hand, there is a growing diffusion and application of information and communication technologies (ICT).

The literature clearly identifies how the expansion of the service sector can improve employment opportunities for women. On the one hand, jobs in tertiary activities can be appropriate for women (Goldin, 2006). Compared to manufacturing, jobs in the service sector require a relatively greater use of qualifications related to knowledge and communication while requiring less intense qualifications related to strength and manual tasks. On the other hand, to a certain degree, jobs in the service sector involve the development of tasks that are similar or related to tasks that have previously been done by women in the family environment. Without a doubt, the gradually increasing dominance of the tertiary sector in the economy, which specifically leads to the growth of employment linked to service activities, may have translated into an increase in demand for the female workforce.

Consideration of the tertiarisation process in labour activities as a variable that explains women's results in the workforce is well described in the literature, both in general terms (Galor and Weil, 1996; Rendall, 2010; Ngai and Petrongolo, 2013) and specifically in the Spanish case (Iglesias et al, 2003; Iglesias et al, 2010; Dueñas et al, 2013). In these work the fundamental hypothesis focuses on the idea that technological change is proper service activities is based and requires a kind and qualifications and skills for which women possess a certain comparative advantage over men.

Similar to the above-mentioned case of employment linked to services, employment growth related to the use of ICTs can improve women's work opportunities, given that these jobs may also be more appropriate for them (OCDE, 2007). Again, the diffusion of new technologies might induce a change in demand due to qualifications that favour women (Carnoy, 2002).

The existing literature on this topic supports the idea that the diffusion of ICTs generally improves women's labor situation, based on the empowering effect that it can have on women by increasing their labour opportunities (Melhem et al, 2009; Ng and Mitter, 2005; Hafkin and Huyer, 2006). Although scarce, documents that analyse the consequences of ICT for women's labour conditions conclude that increasing the level of ICT infrastructure tends to improve gender equality in education and employment, ultimately improving gender equality (Chen, 2004). However, it has also been noted that gender inequality in the workplace is present in jobs that are strongly linked to ICT. Unlike men, women tend to concentrate into ICT occupations that require fewer qualifications, which leads to situations of labour segregation and salary gaps to women's

detriment, even in ICT-related jobs (Truss et al, 2012; International Labour Organization ILO, 2001; OCDE, 2007; Castaño and Webster, 2011).

Adopting that perspective, literature related to the Spanish case concludes that ICT has positive effects on labour variables related to women, such as over-education (Iglesias et al, 2010), segregation (Dueñas et al, in press) and salaries (Castaño et al, 2010). Studies that focus on employment that is tied to ICT conclude that according to these different perspectives, the use of ICT reduces gender inequality to a certain degree, even though these positive effects seem to be less intense than initially expected.

A bridging point between service activities and the use of ICT, knowledge-intensive services (KIS) include those service activities that are particularly related to the use, application and development of ICTs, including tertiary activities such as research and development, strategic consultancy and management services, market research and business intelligence, among others. These services depend to a large degree on professional knowledge and provide high value added support to innovation processes in small and medium enterprises (SMEs). They are considered a central element in the development of innovation processes, highlighted by their dynamism and rapid growth within the tertiary sector (Boden and Miles, 2000). KIS bring together some of the more relevant elements related to transformations induced by tertiarisation processes in the productive structure because they are part of the reason for the association of new service activities with processes such as the evolution of productivity, technological change and innovation processes.

Based on the framework of the previous arguments, the main purpose of this research is to determine to what extent the expansion of tertiary employment, specifically that related to KIS, is capable of improving women's labour position in general, thus reducing gender differences in the labour market. To that end, this study will focus on analyzing gender pay gaps (GPGs) because they are one of the most relevant expressions of the differences between women and men in the workforce.

Due to the central role played by KIS in the context of the Knowledge-based Economy, this kind of services is focusing a wide range of researches, especially related with aspect as knowledge, innovation, technology, productivity and economic growth (Muller and Doloreux, 2009, for instance). Although some exception can be mentioned - Consoli and Elche-Hortelano (2010) studies skills and qualifications requirements in employment working in KIS; Nierling (2008) analyses occupational structure from a gender perspective - up to now very little effort has been done in order to know labour traits of employment engaged in KIS. So, the article also regards increase our knowledge about employment characteristics of a so strategic kind of service activities.

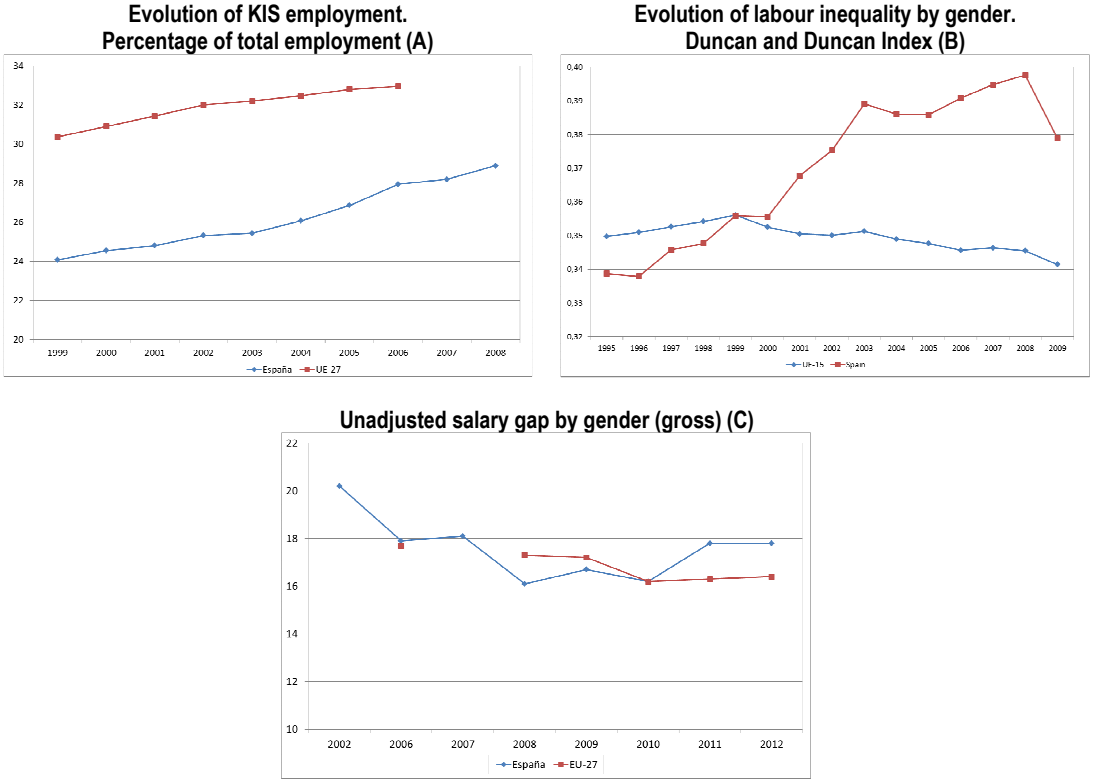
Accordingly, the work will first characterize employment related to the service sector in general and that of KIS in particular, then compare the salary differences between women and men in both service-sector fields to the corresponding differences in other economic activities (from here on, non Services and non KIS). The objective will be to determine whether the service sector, particularly KIS, significantly modifies salary differences. To reach these objectives, this research will be organized around the three main and more usual analytical themes dealing with the analysis of GPG:

a) Measuring the pay gap between women and men.

b) Explaining the GPG through its decomposition into the aspect that can be explained by the existence of differences in women's and men's characteristics with respect to labour and the aspect that cannot be explained in that way, which to a certain degree may be linked to discrimination.
c) Analyzing the GPG along the salary distribution to determine whether the trends found with respect to salary differences are generally present for all women or, on the contrary, whether women at different (increasing) salary levels present different (increasing) patterns in terms of their salary differences compared to men (i.e., the glass ceiling).

Because the analysis allows for differentiation between KIS, tertiary activities, non-KIS and all other employment sectors, the results will allow us to determine whether employment linked to more advanced tertiary activities significantly improves the observed situation with respect to the GPG.

**Figure 1. Characteristic situation in Spain compared to that of the EU. Source: Eurostat.**




The article centres its analysis on the Spanish case. This decision is justified by two arguments that, in our opinion, make the study of the Spanish economy particularly relevant. First, the use of ICTs, the expansion of tertiary activities and the growth in employment linked to KIS activities are processes that have occurred with greater intensity in Spain, which, despite having been a late starter, allows us to bring our position closer to those of our neighbouring countries (figure 1 A). Second, despite the fact that, as mentioned previously, gender differences have been reduced considerably in Spain, they are still present to a greater degree and more persistent than in the rest of the European Union (EU) (figure 1.B). Third, the unadjusted[1] GPG in our country,

[1] This term refers to the unadjusted gender pay gap (GPG), estimated by Eurostat as the difference between men's net mean salaries per hour compared to women's over the men's value. For more details, consult Eurostat's methodology online (metadata).

although similar to that of the EU as a whole, has persisted over time and has slightly increased since 2010 (figure 1.C) Accordingly, the case of the Spanish labour market accentuates the relationship between KIS employment and labour inequalities by gender, and thus, its analysis may be particularly relevant and instructive.

The rest of the article is organised as follows. Section 2 focuses on reviewing existing economic literature related to analysing the GPG. Section 3 specifies the database used and definitions applied while descriptively analysing the fundamental employment characteristics in the service sector in general and that of the KIS in particular. Section 4 describes the empirical strategy, applied methodology and results obtained. The article ends with a final discussion and conclusion based on the results obtained by the research.

## 2. Theoretical framework for the explanation of the GPG.

Explaining the presence of the GPG is complex, and the literature contains many hypotheses. According to Altonji and Black (1999), the starting point for explaining the GPG is the presence of **differences in the characteristics and preferences** of women and men. The GPG can be seen in the differences between men and women's labour results, but its explanation can be found in the fact that economically, women and men are not the same. The genders are paid different salaries because they exhibit different characteristics that intervene in determining productivity and, therefore, salaries. Complementarily, it may also be possible that part of this difference is because women and men also have different preferences and, thus, make different workplace decisions. Finally, and to the degree that these differences cannot explain the pay gap entirely, the remaining unexplained difference is due to the occurrence of **discrimination** against women—or at least, differential treatment.

From the perspective of characteristics, differences in human capital are the most relevant (Becker, 1965). On the other side, there are three principal hypotheses that aim to explain the occurrence of discrimination: the theory of taste for discrimination (Becker, 1957), occupational exclusion (Bergmann, 1974) and statistical discrimination (Phelps, 1972; Arrow, 1973). We must note that **discrimination** may occur not only within the labour market but also before individuals gain access to the labour market, determining their characteristics and preferences or influencing the processes that lead to their formation (Altonji and Black, 1999). These processes, typically called **pre-market** discrimination, refer to, e.g., acquiring an education or to the processes that occur in this environment (i.e., family and intergenerational transmission).

This reasoning framework has been developed through new elements referencing the fact that women and men can also be differentiated through their **psychological attributes and social preferences** (Bertrand, 2010). When these attributes and preferences are rewarded by the market, they interfere in salary determinations and salaries gap.

One important issue is the link between preferences (women and men's psychological attributes and social preferences), gender identity (Alkerlof and Kranton 2000) and social norms (Fernández, 2007). Gender identity may involve specific preferences and in practice translates to social norms that, although persistent, may nevertheless change over time.

In conclusion, it can be said that labour gender differences in general, and the GPG in particular, can be explained by two different components: the presence of differences in men and women's characteristics and preferences, on the one hand, and the presence of discrimination or unequal treatment, on the other. Women and men exhibit differences because some of their characteristics are different, which is important in understanding the results of the labour market.

The fact that men and women occupy different jobs and/or receive different salaries can be explained by men and women's differences in human capital, the varied aspects that explain those differences and the different variables that support the characteristics of various jobs. To the degree that these characteristics do not completely explain the differences observed between men and women, the presence of discrimination—i.e., the fact that economically equal groups receive different treatment—constitutes a complementary explanation.

**3. Data, definitions and descriptive analysis.**

The data used in this research come from the Spanish Labor Force Survey (in Spanish, abbreviated as EPA) for the second quarter of 2010, on the one hand, and from the building of data *pools* that combine different transverse surveys from the Life Condition Survey (in Spanish, abbreviated as ECV) created by the Institute of National Statistics (in Spanish, abbreviated as INE) from 2009-2012[2], on the other hand. The first source of data will help us build a general framework and describe tertiary employment, KIS and non-KIS. The second database will allow us to analyse the existing pay gap between men and women.

Compared to other available data sources, the ECV stands out due to its wealth of data related to labour and family conciliation and the possibilities of developing the known Heckman filter, as will be subsequently explained in the methodology section. The ECV, developed by the INE, offers information on individuals' gross and net income along with a large amount of personal, family and social data that can be used to statistically justify individual incomes.

Due to the strategic importance of different activity fields for economic activity, productivity and growth, Eurostat develops statistics with which to learn about those fields' technological intensity. Through the use of sectorial and product criteria, Eurostat's statistics lead to different sectorial groups—industry groups are based on their technological intensity (high-tech industry) and service groups are based on the presence of employment with tertiary qualifications (KIS). This way, KIS are the services activities that have a closer relationship to the use, production and application of new technologies (i.e., ICT). According to Eurostat (2013), KIS are composed of the aggregation of different tertiary activities (table 1).

The data corresponding to the EPA for the second quarter of 2010 show that the Spanish economy is clearly a service economy. Seventy two point four per cent of employment involves some branch of tertiary activity. In comparison, primary and secondary activities occupy 27.4% of the employed population. More specifically, more advanced services activities—i.e., KIS—represent 34.2% of all employment and 47.2% of employment in the service sector, occupying 6.3 million people.

[2] This period was the last period available at the time this article was written; however, it is also the period that has a homogeneous definition of activities based on CNAE-09. The data shown have been established as the mean annual figures for the years analysed.

**Table 1. Definition of KIS-Knowledge Intensive Service. Source: Eurostat, 2013.**

| Digit | Title | Codes NACE Rev.2 à 2 digits |
|---|---|---|
| 5 | Knowledge-intensive market services | 50 to 51 Water transport, Air transport<br>69 to 71 Legal and accounting activities, Activities of head offices; management consultancy<br>Activities, Architectural and engineering activities; technical testing and analysis<br>73 to 74 Advertising and market research, Other professional, scientific and technical activities<br>78 Employment activities<br>80 Security and investigation activities |
| 6 | High-Tech Knowledge intensive services | 59 to 63 Motion picture, video and television programme production, sound recording and music<br>Publishing activities, Programming and broadcasting activities, Telecommunications, Computer<br>Programming, consultancy and related activities, Information service activities<br>72 Scientific research and development |
| 7 | Knowledge-intensive financial services | 64 to 66 Financial and insurance activities (section K) |
| 8 | Other Knowledge-intensive services | 58 Publishing activities<br>75 Veterinary activities<br>84 to 93 Public administration and defense, compulsory social security (section O), Education (section P), Human health and social work activities (section Q), Arts, entertainment and recreation (section R) |

Table 2 compares the fundamental characteristics of employment in KIS, all other service activities (non-KIS) and non-service activities (agriculture, industry, construction). There is a verifiably greater presence of women in the service sector. Both in KIS and in non-KIS, more than half of those employed are women, compared to only 20% in non-tertiary activities. Although age does not introduce significant differences among the three sectors, married individuals are relatively less common in services. The presence of foreign individuals is notably lower in KIS activities, with an immigrant presence four and three times lower than observed in non-KIS and non-tertiary activities, respectively. Another feature that introduces a very remarkable difference between KIS employment and its alternatives is the level of its employees' educations, which is much higher in the case of KIS. In this type of activity, 64% of employees hold university degrees, compared to 21% and 24% in all other groups. The proportion of salaried employees in KIS is also notably more common, which could indicate activities that are conducted in business organisations characterised by a greater level of formalisation and a larger size. The distribution of employment by occupations again points to the existence of important differences—in terms of qualifications—among the three sectorial groups. Whereas employment in non-tertiary activities is particularly concentrated in people with traditional manual qualifications and employment in non-KIS is concentrated in people with non-manual, intermediate qualifications, employment in KIS exhibits higher concentrations of non-manual occupations with elevated qualifications (professionals and support technicians). These qualification differences translate to a greater frequency in KIS employment of labour tenure of more than 5 years, although the trends are not generally conclusive. Part-time employment is particularly common in non-KIS activities (20%), although it is also involuntary to a greater degree and exhibits a lesser presence in non-tertiary activities (5%). Finally, lower rates of temporality can be seen in KIS employment, whereas greater rates can be seen in primary and secondary activity employment.

**Table 2. Characteristics of employment for KIS, non-KIS and non-service activities. Source: EPA, second quarter of 2010.**

| Characteristics | KIS | Non-KIS | Non-services |
|---|---|---|---|
| **Gender** | | | |
| Men | 46.35 | 46.62 | 80.71 |
| Women | 53.65 | 53.38 | 19.9 |
| **Age** | | | |
| 16-24 | 5.04 | 8.22 | 5.91 |
| 25-34 | 26.75 | 27.82 | 26.74 |
| 35-44 | 29.25 | 29.03 | 31.43 |
| 45-54 | 25.98 | 23.22 | 22.48 |
| 55 and above | 12.98 | 11.71 | 13.44 |
| **Marital Status** | | | |
| Single | 41.75 | 43.00 | 35.77 |
| Married | 58.25 | 57.00 | 64.23 |
| **Nationality** | | | |
| Spanish | 94.31 | 79.46 | 85.46 |
| Foreign | 5.69 | 20.54 | 14.54 |
| **Education** | | | |
| Primary | 15.53 | 49.91 | 53.73 |
| Secondary | 20.95 | 28.90 | 21.66 |
| Tertiary | 63.52 | 21.19 | 24.61 |
| **Employment Status** | | | |
| Employer | 2.77 | 7.53 | 6.50 |
| Self-employed | 6.39 | 13.37 | 14.13 |
| Employed | 90.84 | 79.10 | 79.37 |
| **Occupations** | | | |
| Directors | 4.61 | 12.26 | 6.53 |
| Professionals | 36.80 | 1.84 | 4.51 |
| Technicians and associated professionals | 20.47 | 8.30 | 9.14 |
| Administrative | 12.36 | 9.37 | 5.06 |
| Service and commercial workers | 16.41 | 30.29 | 1.02 |
| Agriculture qualified and assimilated workers | 0.48 | 0.95 | 7.36 |
| Construction workers, excluding electricians | 2.20 | 5.50 | 36.48 |
| Machinery, plant and assembly operators | 1.11 | 9.21 | 17.05 |
| Basic occupations | 5.56 | 22.29 | 12.85 |
| **Duration of Contract** | | | |
| Less than 1 year | 13.06 | 19.02 | 17.13 |
| From 1 to 3 years | 15.59 | 18.14 | 13.71 |
| From 3 to 5 years | 11.26 | 14.44 | 12.01 |
| More than 5 years | 60.09 | 48.39 | 57.15 |
| **Workday** | | | |
| Full time | 87.40 | 79.74 | 94.66 |
| Part time | 12.60 | 20.26 | 5.34 |
| **Willingness to Engage in Part-time Employment** | | | |
| No | 5.66 | 10.84 | 2.16 |
| Yes | 94.34 | 89.16 | 97.84 |
| **Labour Contract** | | | |
| Indefinite | 77.80 | 75.02 | 71.46 |
| Temporary | 22.20 | 24.98 | 28.54 |

**Table 3. Differences in the characteristics of women and men engaged in KIS, non-KIS and non-services activities. Source: EPA, second quarter of 2010.**

| Characteristics | KIS | Non-KIS | Non-services |
|---|---|---|---|
| **Age** | | | |
| 16-24 | 107.68 | 115.32 | 87.40 |
| 25-34 | 102.46 | 117.28 | 117.11 |
| 35-44 | 103.41 | 101.17 | 96.04 |
| 45-54 | 101.10 | 87.36 | 101.11 |
| 55 and above | 83.89 | 79.11 | 80.93 |
| **Marital Status** | | | |
| Single | 99.40 | 113.22 | 104.95 |
| Married | 100.43 | 91.13 | 97.28 |
| **Nationality** | | | |
| Spanish | 101.10 | 88.53 | 105.17 |
| Foreign | 83.55 | 163.25 | 71.50 |
| **Education** | | | |
| Primary | 84.99 | 97.57 | 77.31 |
| Secondary | 88.90 | 100.31 | 108.30 |
| Tertiary | 108.23 | 105.52 | 148.82 |
| **Employment Status** | | | |
| Employer | 46.61 | 49.00 | 55.87 |
| Self-employed | 64.02 | 67.68 | 103.67 |
| Employed | 105.57 | 114.29 | 103.32 |
| **Occupations** | | | |
| Directors | 45.55 | 58.77 | 82.99 |
| Professionals | 110.27 | 90.04 | 150.87 |
| Technicians and associated professionals | 91.17 | 68.68 | 271.77 |
| Administrative | 168.11 | 160.38 | 635.18 |
| Services and commercial workers | 115.57 | 173.28 | 451.43 |
| Agriculture qualified and assimilated workers | 12.91 | 4.16 | 120.66 |
| Construction workers, excluding electricians | 8.05 | 9.48 | 26.02 |
| Machinery, plant and assembly operators | 14.22 | 6.49 | 88.49 |
| Basic occupations | 100.45 | 245.23 | 132.04 |
| **Duration of Contract** | | | |
| Less than 1 year | 114.89 | 121.96 | 93.89 |
| From 1 to 3 years | 116.94 | 144.59 | 102.93 |
| From 3 to 5 years | 116.64 | 136.83 | 126.41 |
| More than 5 years | 90.61 | 73.83 | 95.90 |
| **Workday** | | | |
| Full time | 88.89 | 74.22 | 86.19 |
| Part time | 246.21 | 416.13 | 588.74 |
| **Willingness to Engage in Part-time Employment** | | | |
| No | 229.26 | 369.67 | 300.43 |
| Yes | 95.53 | 87.47 | 96.83 |
| **Labour Contract** | | | |
| Indefinite | 91.99 | 92.99 | 107.47 |
| Temporary | 135.03 | 125.03 | 82.24 |

To summarise, KIS activities integrate notably female-based employment with a greater presence of individuals with Spanish nationality and higher educational levels. KIS activities are concentrated in occupations with a greater qualification level and better working conditions (lower rates of temporary and part-time work, a higher proportion of salaried workers and greater stability in the labour relationship).

Table 3 analyses the existence of differences in the characteristics set forth above between women and men that work in the KIS, the non-KIS and the non-service sectors. The table shows the frequency of each category for women if we make the frequency of men equal to 100. Ignoring minor differences, the following important facts can be deduced:

a) For both service-sector groups (KIS and non-KIS), women are more common than men in younger groups. This trend becomes less clear in the case of non-tertiary activities.
b) Fewer immigrant women than men are seen, particularly in KIS and in non-tertiary activities.
c) For all sector groups, women with university degrees are more common than men, with the difference being particularly strong in non-tertiary activities.
d) Women surpass men in their relative presence as salaried employees, whereas they are less common in self-employed categories and particularly in the employer category.
e) The "chief executive" occupation always exhibits a clear dominance by men.
f) In apparent contradiction to our observations related to educational levels, occupations with a greater relative presence of women are those in "administrative", "service worker" and "basic occupations", even within KIS, which has an occupational structure focused on qualified non-manual tasks.
g) Manual occupations are clearly biased towards men.
h) Qualified non-manual occupations exhibit diverse trends, but women only surpass men in these tasks in non-tertiary activities.
i) Women predominate in working relationships of shorter duration.
j) Women have a majority presence in part-time employment, especially the involuntary type.
k) Women also have a majority presence in temporary employment, except in non-service activities.

Therefore, particularly with respect to KIS, it is worth mentioning that although women show personal characteristics superior to those of men (age, nationality and especially educational level) and despite the fact that KIS activities exhibit superior characteristics associated with their employment (occupations, part-time status, temporary status, stability), women benefit from those characteristics to a much lesser degree than men. Only activities that are not related to services introduce some improvement in this disadvantageous situation for women. Accordingly, we observe that, a priori, despite their peculiarities and special relationship with technology and the knowledge community, KIS reproduce trends of gender allocation similar to those observed in the entire employment population.

The mean wages captured in the service sector are not far from the mean for the entire economy or from the wages captured outside of the tertiary sector (table 4). However, when looking at differentiation by gender, women earn verifiably higher mean monthly salaries in net terms when they are employed in KIS (1,488.2 Euros, mean per month).

**Table 4. Monthly net salary for different activity sectors. (Source: ECV, pool 2009-2012).**

| Mean WN | Total | Men | Women | Gross Difference (Men-Women) | % over W women |
|---|---|---|---|---|---|
| **Total** | **1,420.9** | **1,567.1** | **1,249.0** | **318.1** | **25.5%** |
| Services | 1,433.1 | 1,636.7 | 1,265.6 | 371.0 | 29.3% |
| Non-services | 1,421.1 | 1,478,2 | 1,209.0 | 269.2 | 22.3% |
| KIS | 1,628.6 | 1,782.8 | 1,488.2 | 294.6 | 19.8% |
| Non-KIS | 1,079.4 | 1,325.9 | 911.3 | 414.6 | 45.5% |

The GPG differs from one labour location to the next. The greatest difference in gross and relative terms is found in non-KIS sectors (with 414.6 Euros, mean per month, which represents 45.5% of the mean salary of a woman hired in that sector). Conversely, the smallest absolute differences are found in non-service activities (with 269.2 Euros, mean per month) and in relative terms in KIS, where the GPG represents 19.8% of the mean female monthly salary.

## 4. GPG, the tertiary sector and KIS.

The objective of this work is to analyse the salary differences between men and women, determining the effect of the service sector and in particular KIS. To that end, and based on measuring the GPG, two analyses will be carried out: the first identifies the explicative components (characteristics versus differential treatment) that explain the GPG, and the second analyze the behaviour of salary differences between women and men throughout the salary distribution.

### *4.1 Characteristics of differential treatment: explicative components of labour differences by gender.*

Regarding the first analysis, we will use the Oaxaca-Blinder decomposition (Neumark, 1988; Oaxaca and Ransom, 1994, 1999) to determine the proportion of salary differences that either can be explained or cannot be explained by differences in characteristics between men and women. According to this methodology, we will first estimate a series of salary equations with which to predict the salary (in logarithms) of men and women as a function of their personal and labour characteristics.

$$\ln W_H = \beta_0 + \beta_1 X_1 + \mu \qquad (1)$$

$$\ln W_M = \beta_0 + \beta_1 X_1 + \mu \qquad (2)$$

Using these equations, we determine how men and women's labour characteristics are remunerated (or given a value) in the labour market through the estimation of the coefficient $\beta_1$. For example, people with higher education tend to earn a salary, in mean terms, higher than less-educated workers. Therefore, higher education is a personal characteristic that is remunerated positively, and therefore, in the estimations, it obtains a positive associated ß coefficient. Following the previously mentioned authors, one possible differentiation of the previous salary equations is as follows:

$$\ln W_H - \ln W_M = (\overline{X_H} - \overline{X_M})' \hat{\beta}_H + \overline{X_M}' (\widehat{\beta_M} - \widehat{\beta_H}) \qquad (3)$$

where:

a) $(\overline{X_H} - \overline{X_M})' \hat{\beta}_H$ is the "explained" component due to the different talents to be remunerated associated with the different groups. In this case, men and women's different labour and personal characteristics are a basis for their unequal salaries.
b) $\overline{X_M}' (\hat{\beta}_M - \hat{\beta}_H)$ is the "unexplained" part of the estimation, which is not based on unequal characteristics and could be described as salary discrimination or different salary treatment without justification. In other words, given equal characteristics, salaries or salary treatment are not the same by gender.

To estimate this decomposition, we consider the bias selection correction by applying the Heckman filter (1979), which establishes a different weight for men and women as a function of the probability of participating in the labour market and, therefore, of obtaining salaried employment. The filter simply assigns a weight to each group to correct the possible selection bias for each collective group being analysed. In our case, when applying the filter, we have considered the differentiation in the sample between active and inactive people. The statistical annex, table A.1, shows the developed salary equations.

Table 5 gathers the results of applying the Oaxaca-Blinder decomposition to the entire economy, to the service sector and to all other non-tertiary activities. In our case, the dependent variable is the net monthly salary in neutral logarithms[3]. The explanatory variables considered gather both personal variables (age, age squared, marital status, offspring, nationality and education level) and labour variables (duration of contract, duration of workday, supervisory work, no manual occupation, workplace size) along with some control variables (whether the residential nucleus is very populated, whether the region exhibits salaries above the national mean and whether the sampling years of the data pool are transversal). All of these variables attempt to measure the principal characteristics remunerated in the jobs. However, they also measure issues related to labour and family conciliation that may influence job selection and therefore salary. Therefore, we are primarily concerned with variables such as the presence of dependent offspring in the home and holding a part-time job[4]. Including the part-time variable is fundamental when analysing monthly salary because it allows for better controlling of the mean salary differences estimated in the model. In the Spanish case, the part-time variable is even more necessary given the strong link between women and part-time employment.

The first portion of the table confirms that independent of the activity sector being observed, women earn lower salaries than men (in terms of the neutral logarithm, women exhibit approximate values of seven, whereas men surpass that figure), but again, it is the service sector in which women receive higher net mean salaries (7.037). In addition, when estimating the existing GPG, no excessively relevant differences are obtained in absolute terms (0.252 for total employment, 0.275 for services and 0.240 for all other non-tertiary activities). The decomposition of these differences shows that the greater proportion is unexplained by the characteristics, and thus, on occasion, they relate to differential or potentially discriminatory treatment. It is relevant to confirm that the unexplained portion is lower in service-sector employment (55.2%). This fact,

[3] We consider the monthly salary, not the hourly salary, because monthly salary is more decisive for labour and family conciliation and because when studying different sectors, the sharpest differences occur in the monthly measure instead of in the hourly measure.
[4] Although the ECV collects the motives for part-time employment, its information does not allow for identifying whether a respondent's labour situation is voluntary, which is a fundamental issue when studying personal preferences in labour segregation and analysing salary gaps.

among other factors, such as the existence of a greater mean remuneration or more adequate labour characteristics, could explain the greater female placement in service activities.

The rest of table 5 indicates the contribution of the considered variables to the explained portion, estimated by the Oaxaca-Blinder decomposition. From this observation, we can conclude that higher educational levels and non-manual occupations are characteristics that contribute to reducing the salary differences between men and women. Conversely, the factor that contributes to a greater degree to supporting a GPG is the greater involvement of women with generally less-remunerated part-time employment. To a lesser degree, other variables that increase the GPG include age and supervisory work.

**Table 5. Oaxaca-Blinder salary decomposition. Total, services and non-services employment. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**

| | Total | | | | Services | | | | Non-services | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | | % | Coef. | Sig. | | % | Coef. | Sig. | | % |
| **Salary decomposition** | | | | | | | | | | | | |
| LWN—Men | 7.284 | 0.000 | *** | | 7.312 | 0.000 | *** | | 7.238 | 0.000 | *** | |
| LWN—Women | 7.032 | 0.000 | *** | | 7.037 | 0.000 | *** | | 6.998 | 0.000 | *** | |
| Difference | 0.252 | 0.000 | *** | | 0.275 | 0.000 | *** | | 0.240 | 0.000 | *** | |
| Explained | 0.085 | 0.000 | *** | **33.6%** | 0.123 | 0.000 | *** | **44.8%** | 0.026 | 0.021 | ** | **10.7%** |
| Not explained | 0.167 | 0.000 | *** | **66.4%** | 0.152 | 0.000 | *** | **55.2%** | 0.214 | 0.000 | *** | **89.3%** |
| | | | | | | | | | | | | |
| **Contribution of the explained portion** | | | | | | | | | | | | |
| Age | 0.011 | 0.000 | *** | | 0.011 | 0.000 | *** | | 0.022 | 0.001 | *** | |
| $Age^2$ | -0.006 | 0.000 | *** | | -0.006 | 0.002 | *** | | -0.014 | 0.019 | ** | |
| Married | 0.002 | 0.000 | *** | | 0.002 | 0.000 | *** | | 0.003 | 0.005 | *** | |
| Home with dependent offspring | -0.001 | 0.032 | ** | | -0.001 | 0.001 | *** | | 0.000 | 0.285 | | |
| Foreign | 0.000 | 0.480 | | | 0.001 | 0.018 | ** | | -0.004 | 0.007 | *** | |
| Higher education | -0.019 | 0.000 | *** | | -0.008 | 0.000 | *** | | -0.020 | 0.000 | *** | |
| Temporary contract | 0.005 | 0.000 | *** | | 0.010 | 0.000 | *** | | 0.001 | 0.691 | | |
| Partial workday | 0.103 | 0.000 | *** | | 0.098 | 0.000 | *** | | 0.085 | 0.000 | *** | |
| Supervisory work | 0.017 | 0.000 | *** | | 0.018 | 0.000 | *** | | 0.013 | 0.000 | *** | |
| Non-manual occupation | -0.031 | 0.000 | *** | | -0.009 | 0.000 | *** | | -0.054 | 0.000 | *** | |
| Size of the business (smaller than ten employees) | 0.007 | 0.000 | *** | | 0.008 | 0.000 | *** | | -0.002 | 0.116 | | |
| Resident of a very populated city | -0.001 | 0.008 | *** | | 0.000 | 0.411 | | | -0.001 | 0.054 | * | |
| Resident of a region with salaries above the mean | -0.002 | 0.000 | *** | | -0.001 | 0.005 | *** | | -0.003 | 0.068 | * | |
| 2010 | 0.000 | 0.796 | | | 0.000 | 0.567 | | | 0.000 | 0.839 | | |
| 2011 | 0.000 | 0.941 | | | 0.000 | 0.789 | | | 0.000 | 0.593 | | |
| 2012 | 0.000 | 0.308 | | | 0.000 | 0.555 | | | 0.000 | 0.659 | | |
| Constant | 0.000 | 0.000 | *** | | 0.000 | 0.000 | *** | | 0.000 | 0.000 | *** | |
| N. sample observations | 36,721 | | | | 26,626 | | | | 10,035 | | | |

***** Significant to 99% ** Significant to 95% * Significant to 90%**

The presence of offspring in the home does not offer a very high coefficient, but when it is significant, it shows a negative sign. Therefore, there are fewer pay differences between salaried men and women with children than among other workers. Alternatively, women with children search for and receive more equal pay compared to men with children.

In the case of the tertiary sector, the trend in salary differences is based on the same characteristics, although with a lower intensity. Once again, it stands out that part-time employment is the labour characteristic that establishes the greatest pay differences by gender. Possibly due to the productive nature of the sector, non-manual occupations show a lower impact on the determination of a GPG within the service sector.

**Table 6. Oaxaca-Blinder salary decomposition. KIS and non KIS. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**

| | KIS | | | | non KIS | | | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Sig. | | % | Coef. | Sig. | | % |
| **Salary decomposition** | | | | | | | | |
| LWN—Men | 7,456 | 0,000 | *** | | 7,118 | 0,000 | *** | |
| LWN—Women | 7,230 | 0,000 | *** | | 6,769 | 0,000 | *** | |
| Difference | 0,226 | 0,000 | *** | | 0,349 | 0,000 | *** | |
| Explained | 0,093 | 0,000 | *** | **40,9%** | 0,175 | 0,000 | *** | **50,1%** |
| Not explained | 0,134 | 0,000 | *** | **59,1%** | 0,174 | 0,000 | *** | **49,9%** |
| | | | | | | | | |
| **Contribution of the explained portion** | | | | | | | | |
| Age | 0,019 | 0,000 | *** | | 0,009 | 0,074 | * | |
| $Age^2$ | -0,013 | 0,001 | *** | | -0,008 | 0,070 | * | |
| Married | 0,001 | 0,060 | * | | 0,001 | 0,050 | * | |
| Home with dependent offspring | -0,001 | 0,061 | * | | -0,001 | 0,023 | ** | |
| Foreign | 0,000 | 0,332 | | | 0,003 | 0,009 | *** | |
| Higher education | -0,011 | 0,000 | *** | | 0,002 | 0,046 | ** | |
| Temporary contract | 0,012 | 0,000 | *** | | 0,008 | 0,000 | *** | |
| Partial workday | 0,068 | 0,000 | *** | | 0,118 | 0,000 | *** | |
| Supervisory work | 0,022 | 0,000 | *** | | 0,022 | 0,000 | *** | |
| Non-manual occupation | -0,006 | 0,000 | *** | | 0,010 | 0,000 | *** | |
| Size of the business (smaller than ten employees) | 0,001 | 0,427 | | | 0,011 | 0,000 | *** | |
| Resident of a very populated city | 0,000 | 0,330 | | | 0,000 | 0,743 | | |
| Resident of a region with salaries above the mean | -0,001 | 0,028 | ** | | -0,001 | 0,113 | | |
| 2010 | 0,000 | 0,948 | | | 0,000 | 0,612 | | |
| 2011 | 0,000 | 0,469 | | | 0,000 | 0,826 | | |
| 2012 | 0,001 | 0,278 | | | 0,000 | 0,884 | | |
| Constant | 0,000 | 0,000 | *** | | 0,000 | 0,000 | *** | |
| N. sample observations | 18.128 | | | | 8.498 | | | |

***** Significant to 99% ** Significant to 95% * Significant to 90%**

Table 6 shows again the Oaxaca-Blinder decomposition, this time differentiating between KIS and all other services, which we denominate non-KIS. As with the previous estimations, there remain salary differences in favour of men. However, in absolute terms, the salary differences estimated between women and men are higher outside of KIS (0.226 for KIS versus a difference of 0.349

for non-KIS employment). These differences are explained by the presence of different characteristics between men and women in 40.9% of the KIS sector and 50.1% in the non-KIS sector. The rest of the salary gap by gender (59.1% and 49.8%, respectively) can be attributed to the presence of unexplained differential or potentially discriminatory treatment, which, in this case, is greater for the KIS case.

The variables that are the basis for the previous differences in the KIS case are the unequal contributions of age, the presence of a temporary contract, involvement in part-time work and development of non-manual tasks. The lesser relative presence of part-time employment within KIS may be one of the reasons that this characteristic loses relevance and reduces its contribution to explaining the GPG. Again, having a higher education contributes to reducing differences related to gender, with age becoming an additional part of the picture. The level of education loses some of its intensity relative to the general case given that within KIS, there is more hiring of individuals with higher education, establishing *a priori* a more homogeneous group.

**Figure 2. Summary of results. Salary of women, the GPG and unexplained components by sector definitions. (Source: ECV, authors' elaboration).**

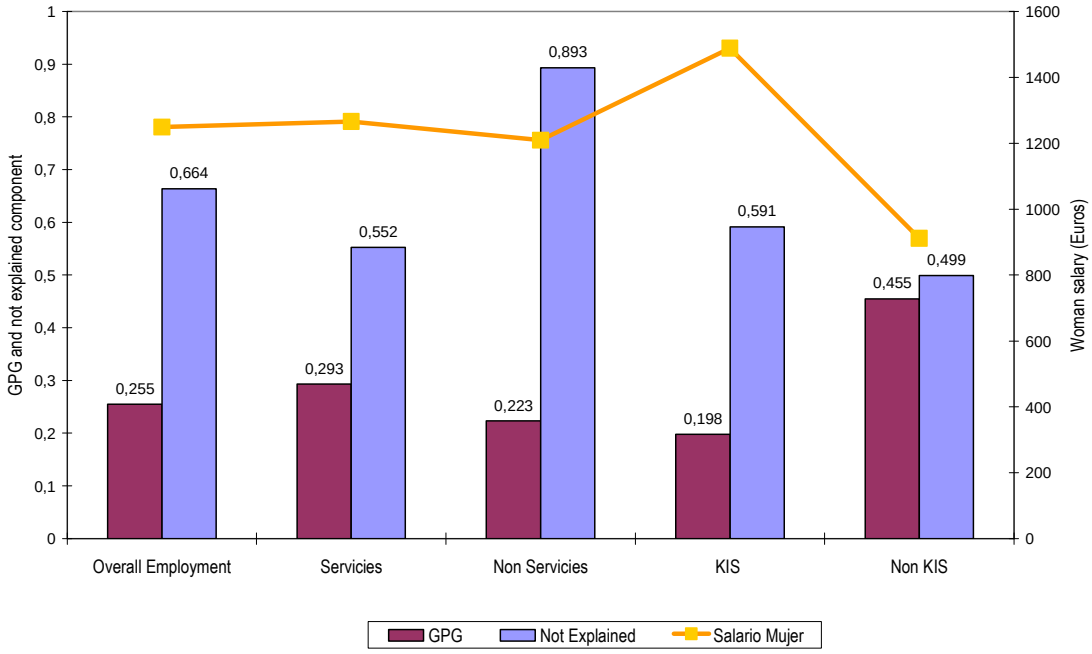



Figure 2 summarises the principal results. It shows, for each sector definition, women's monthly salaries, the existing GPG expressed as parts per unit with respect to men's salaries and the portion of this pay gap unexplained by characteristics (differential or potentially discriminatory treatment), also in parts per unit. It can be seen how, even though services considered as a whole do not substantially improve women's salary situation (i.e., similar salaries to the entire employment pool, with a similar pay gap), KIS are associated with higher salaries for women and a smaller pay gap. However, female employment linked to KIS exhibits an unexplained component of the GPG greater than that in the entire employment pool and the tertiary employment group. Therefore, even though women in KIS activities show lower salary differences in absolute terms, their "discriminatory" treatment is important and we cannot establish that KIS is an ideal labour sector for female employment.

*4.2 The glass ceiling: salary differences throughout the salary distribution.*

With the intent of exploring the GPG in greater depth, we have widened the object of this study towards the set of salary distributions. Our objective is now to verify whether salary differences and the explaining components we have found for women are replicated along the entire salary distribution or whether, on the contrary, there are unequal conditions between women when differentiating by salary levels, which would show the existence of a glass ceiling (i.e., a situation in which pay gaps are greater at the higher end of the distribution) or a sticky floor (situations in which the remuneration level hardly increases when moving up the distribution). In general, women tend to exhibit a less sharp salary distribution that is more displaced to the left than that of men, which shows not only that mean female salaries are lower than men's but also that there is a greater salary differentiation at higher levels of the salary distribution (as seen in the figure of statistical appendix A.2). In contrast to the appropriated estimations, this tends to indicate the existence of a glass ceiling.

To approach this issue, we develop a salary decomposition along the distribution that is similar to those developed previously, now applied on the salary quantiles. Specifically, the estimation methodology followed has been developed by Melly (2006), who establishes the following decomposition:

$$\hat{q}_1(\theta) - \hat{q}_0(\theta) = [\hat{q}_1(\theta) - \hat{q}_C(\theta)] + [\hat{q}_C(\theta) - \hat{q}_0(\theta)] \qquad (4)$$

where:

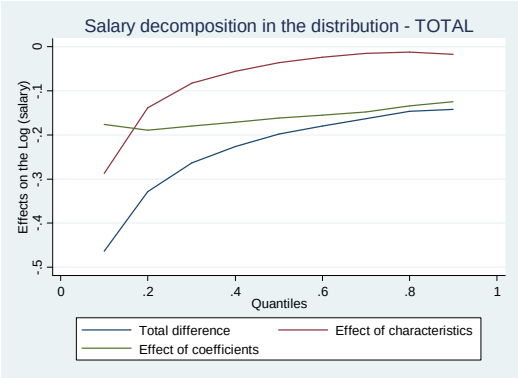
a) The first term of the equation shows the explained portion of the salary differences, in this case for each quantile.
b) The second term reflects the unexplained portion of the salary differences, again for each of the quantiles analysed. This term is estimated based on the counterfactual quantilic distribution $\theta$ , which is observed when people are not subject to differential treatment or the quantilic unconditioned distribution.

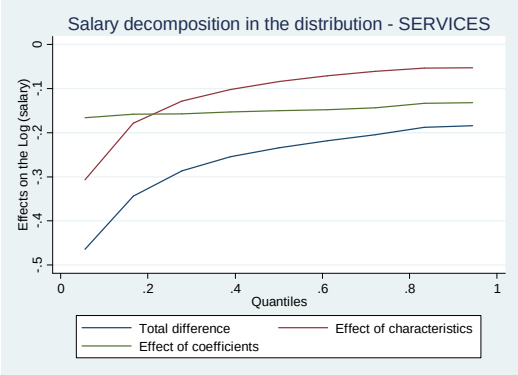
Figure 3 gathers the values that result from applying such decomposition to the analysed sector definitions (the data supporting the figures are shown in table A.3). As shown in the figure, even though in all cases, there is a glass ceiling - which is something that tends to define the Spanish economy, see Carrasco et al (2011), De la Rica (2010), Dolado and Llorens (2004) and Gardeazábal and Ugidos (2005) -. In the case of activities located outside the service sector, the glass ceiling clearly show a higher value. More relevant to the objectives of this study, if we compare the results obtained for the specific case of KIS and non-KIS, we observe that while KIS closely reproduce the situation observed for the entire employment pool, in non-KIS, the glass ceiling seems to disappear because we see a small reduction in pay gaps in absolute terms for the higher salary groups and in the importance of unexplained factors when moving up the salary distribution

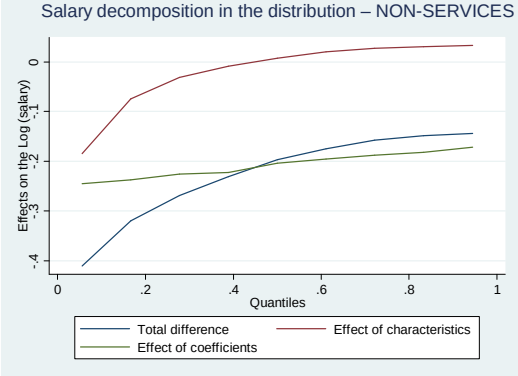
Figure 4 shows the percentage represented by the unexplained portion in the decomposition of pay gaps. This figure allows one to better identify the presence of important discriminatory or unexplained treatment at higher salary ranges for all the cases analysed. In relative or percentage terms, such "discrimination" mostly occurs in the context of non-tertiary activities. More importantly, KIS do not offer better results than the rest of the service sector or than non-KIS services. Therefore, the service sector may favour female employment (in this case, due to

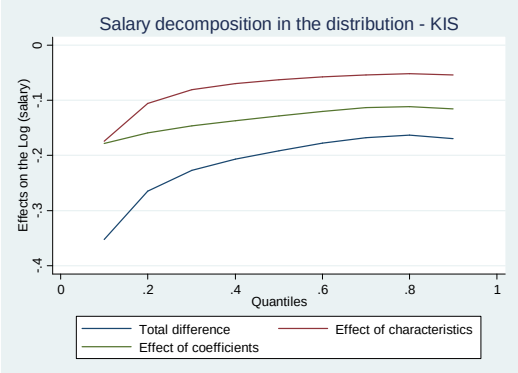
the reduction of the glass ceiling), but KIS is not an especially attractive labour sector for female employment.

**Figure 3. Salary decomposition by quantiles. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**



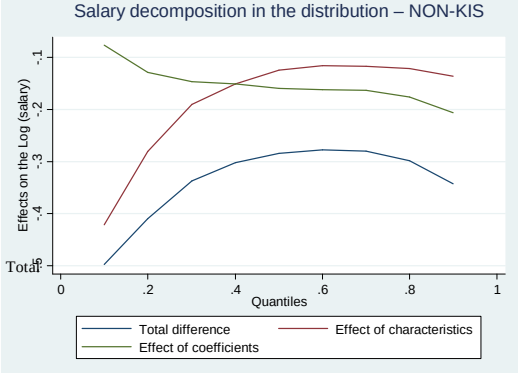
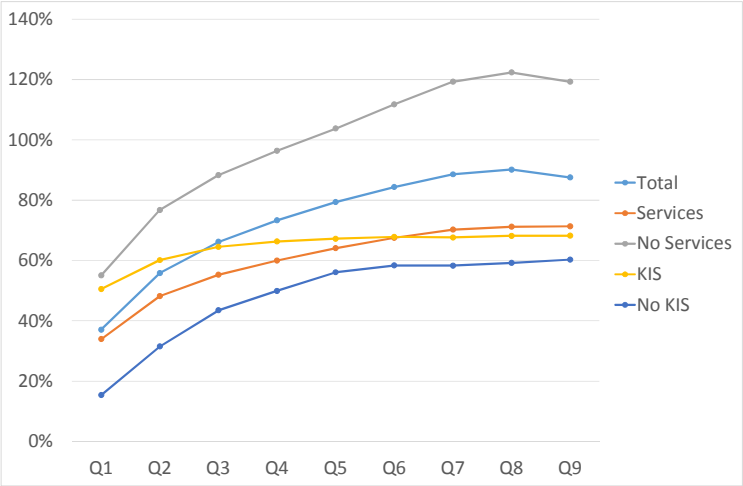



**Figure 4. Salary decomposition by quantiles. Percentage that represents the unexplained portion. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**




Without a doubt, despite the fact that within KIS, the GPG in absolute terms is reduced for the entire distribution, differential treatment continues to be relevant at higher salary ranges, indicating the persistence of discrimination in higher salary groups along with the presence of a glass ceiling.

## 6. Conclusions.

Existing literature clearly point out how services and ICT hoard high potential capacities to remove economic foundations of labor differences by gender. Both factors interplay at KIS activities, a kind of services that is also a key-sector for economic research on the basis of its relations with innovation, knowledge, technology and productivity. The aim of our research has been a twice one: First, to analyze in what extent service and especially KIS are capable to reduce labor differences again women. Second, get depth knowledge about existing labor traits in KIS, a kind of service activities that show a lack of research in relation with this aspect.

Because the service sector, specifically the KIS sector, is favourable for female hiring, where there are certain labour conditions that *a priori* are favourable for the reduction of gender pay gap his article has analysed the salary gap between men and women as a measure of such labour differences by gender in different sectorial groups: services, non services, KIS and non KIS activities.

To get it, a threefold has been carried out. First, we have measure and compare the existing GPG. Second, using the Oaxaca-Blinder decomposition, we have estimated which part of the salary gap may be explained by existing different workplace characteristics between men and women and what part of those differences cannot be explained and are instead associated with patterns of differential treatment or potential discrimination. Third, we have check the existence or not of ceiling glass.

The results obtained establish that although the service sector is more favourable to women in terms of salary, given that women earn higher mean salaries and there is less discrimination in relative terms, this trend cannot be clearly established for KIS, given that even though women in these positions do have higher salaries and experience lower salary differences, discrimination or

differential treatment persists and continues to be as important as in non-KIS and in the tertiary employment sector in general.

Similarly, it has been verified that education and performing a non-manual occupation are labour factors related to the existence of a smaller GPG. Education, or having a higher education, is established in current economic literature as a fundamental tool to avoid labour segregation and, therefore, salary discrimination (Iglesias and Llorente, 2008). In the opposite situation, working part-time is found to determine the presence of significant pay gaps, possibly due to women's greater involvement in this type of work.

Finally, the GPG along the entire salary distribution has been analysed through salary decomposition by quantiles. The presence of a glass ceiling, based on the presence of larger salary differences along with a greater weight of the unexplained component within the higher salary ranges, tends to be the norm in each and every sector analysed. However, within the service sector, the glass ceiling is not as decisive in relative terms as it is in all other non-tertiary activities. Unfortunately, within KIS, salary differences persist in higher salary ranges, a situation that defines the presence of a glass ceiling.

When we consider KIS and non KIS activities into service activities, ceiling glass is only observed related to KIS. Conversely, in the case of non KIS activities, raw salary gap and unexplained component decrease when we move from the bottom to the top of wages distribution, denying the existence of this situation. May be ceiling glass is especially related with more qualified and skilled jobs.

In sum, the KIS sector improves certain aspects of women's salary situation with respect to men, but it does not constitute a working environment free from discrimination. The basis for this finding can be found in the fact that within ICTs, which are strongly linked with developing KIS, freedom from salary discrimination cannot be found (Llorente, *et al* 2013). This fact points to a need for future research to further investigate the more favourable aspects that reduce the pay gap within the KIS sector. With the intent of developing future economic policies, our study points to the need to equalise the participation of men and women in part-time employment, to continue to promote education and to support the growth of the service sector.

The relation that KIS keep with innovation and knowledge don't appear enough condition to definitely remove gender differences, although it is worth to say that KIS is able to reduce in some extent the drawbacks that women usually have to face at the workplace.

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## ANNEXES

**Table A.1 (a). Salary Estimations. Services vs. Non services. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**

| | Services | | | | | | Non Services | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Men | | | Women | | | Men | | | Women | | |
| | Coef. | Sig. | | Coef. | Sig. | | Coef. | Sig. | | Coef. | Sig. | |
| Age | 0,022 | 0,000 | *** | 0,009 | 0,007 | *** | 0,013 | 0,002 | *** | 0,009 | 0,317 | |
| $Age^2$ | 0,000 | 0,000 | *** | 0,000 | 0,317 | | 0,000 | 0,057 | * | 0,000 | 0,603 | |
| Married | 0,081 | 0,000 | *** | 0,016 | 0,126 | | 0,056 | 0,000 | *** | 0,008 | 0,764 | |
| Home with dependent offspring | 0,028 | 0,010 | ** | 0,036 | 0,000 | *** | 0,020 | 0,131 | | 0,036 | 0,163 | |
| Foreign | -0,096 | 0,000 | *** | -0,046 | 0,003 | *** | -0,086 | 0,000 | *** | -0,044 | 0,271 | |
| Higher education | 0,166 | 0,000 | *** | 0,233 | 0,000 | *** | 0,105 | 0,000 | *** | 0,219 | 0,000 | *** |
| Temporary contract | -0,141 | 0,000 | *** | -0,129 | 0,000 | *** | -0,114 | 0,000 | *** | -0,124 | 0,000 | *** |
| Partial workday | -0,623 | 0,000 | *** | -0,617 | 0,000 | *** | -0,652 | 0,000 | *** | -0,548 | 0,000 | *** |
| Supervisory work | 0,172 | 0,000 | *** | 0,163 | 0,000 | *** | 0,172 | 0,000 | *** | 0,161 | 0,000 | *** |
| Non-manual occupation | 0,193 | 0,000 | *** | 0,242 | 0,000 | *** | 0,186 | 0,000 | *** | 0,188 | 0,000 | *** |
| Size of the business (smaller than ten employees) | -0,103 | 0,000 | *** | -0,148 | 0,000 | *** | -0,111 | 0,000 | *** | -0,115 | 0,000 | *** |
| Resident of a very populated city | 0,001 | 0,931 | | 0,008 | 0,408 | | 0,037 | 0,003 | *** | 0,043 | 0,092 | * |
| Resident of a region with salaries above the mean | 0,057 | 0,000 | *** | 0,040 | 0,000 | *** | 0,088 | 0,000 | *** | 0,149 | 0,000 | *** |
| 2010 | -0,001 | 0,968 | | 0,010 | 0,436 | | 0,004 | 0,783 | | -0,002 | 0,955 | |
| 2011 | -0,026 | 0,061 | * | -0,017 | 0,213 | | -0,021 | 0,190 | | 0,018 | 0,574 | |
| 2012 | -0,032 | 0,015 | ** | -0,034 | 0,007 | *** | -0,033 | 0,034 | ** | -0,026 | 0,421 | |
| Constant | 6,520 | 0,000 | *** | 6,631 | 0,000 | *** | 6,775 | 0,000 | *** | 6,577 | 0,954 | |

***** Significant to 99% ** Significant to 95% * Significant to 90%**

**Table A.1 (b). Salary Estimations. KIS vs. Non KIS. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**

| | KIS | | | | | | Non KIS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Men | | | Women | | | Men | | | Women | | |
| | Coef. | Sig. | | Coef. | Sig. | | Coef. | Sig. | | Coef. | Sig. | |
| Age | 0,034 | 0,000 | *** | 0,016 | 0,001 | *** | 0,017 | 0,001 | *** | 0,018 | 0,000 | *** |
| $Age^2$ | 0,000 | 0,000 | *** | 0,000 | 0,123 | | 0,000 | 0,016 | ** | 0,000 | 0,001 | *** |
| Married | 0,093 | 0,000 | *** | 0,026 | 0,067 | * | 0,058 | 0,004 | *** | -0,003 | 0,870 | |
| Home with dependent offspring | 0,019 | 0,214 | | 0,028 | 0,044 | ** | 0,012 | 0,500 | | 0,024 | 0,118 | |
| Foreign | -0,154 | 0,000 | *** | -0,019 | 0,532 | | -0,061 | 0,004 | *** | -0,048 | 0,007 | *** |
| Higher education | 0,194 | 0,000 | *** | 0,281 | 0,000 | *** | 0,087 | 0,000 | *** | 0,100 | 0,000 | *** |
| Temporary contract | -0,177 | 0,000 | *** | -0,138 | 0,000 | *** | -0,105 | 0,000 | *** | -0,104 | 0,000 | *** |
| Partial workday | -0,566 | 0,000 | *** | -0,639 | 0,000 | *** | -0,642 | 0,000 | *** | -0,554 | 0,000 | *** |
| Supervisory work | 0,171 | 0,000 | *** | 0,159 | 0,000 | *** | 0,200 | 0,000 | *** | 0,177 | 0,000 | *** |
| Non-manual occupation | 0,149 | 0,000 | *** | 0,240 | 0,000 | *** | 0,196 | 0,000 | *** | 0,162 | 0,000 | *** |
| Size of the business (smaller than ten employees) | -0,098 | 0,000 | *** | -0,160 | 0,000 | *** | -0,068 | 0,000 | *** | -0,108 | 0,000 | *** |
| Resident of a very populated city | 0,019 | 0,191 | | 0,020 | 0,148 | | -0,011 | 0,529 | | -0,008 | 0,596 | |
| Resident of a region with salaries above the mean | 0,058 | 0,000 | *** | 0,025 | 0,060 | * | 0,053 | 0,002 | *** | 0,070 | 0,000 | *** |
| 2010 | 0,001 | 0,946 | | -0,003 | 0,842 | | -0,014 | 0,506 | | 0,029 | 0,143 | |
| 2011 | -0,029 | 0,127 | | -0,044 | 0,012 | ** | -0,038 | 0,090 | * | 0,014 | 0,484 | |
| 2012 | -0,039 | 0,034 | ** | -0,075 | 0,000 | *** | -0,030 | 0,160 | | 0,013 | 0,511 | |
| Constant | 6,270 | 0,171 | | 6,465 | 0,000 | *** | 6,648 | 0,000 | *** | 6,527 | 0,000 | *** |

***** Significant to 99% ** Significant to 95% * Significant to 90%**

**Figure A.2. Net monthly salary distribution. (Source: ECV, pool 2009-2012).**

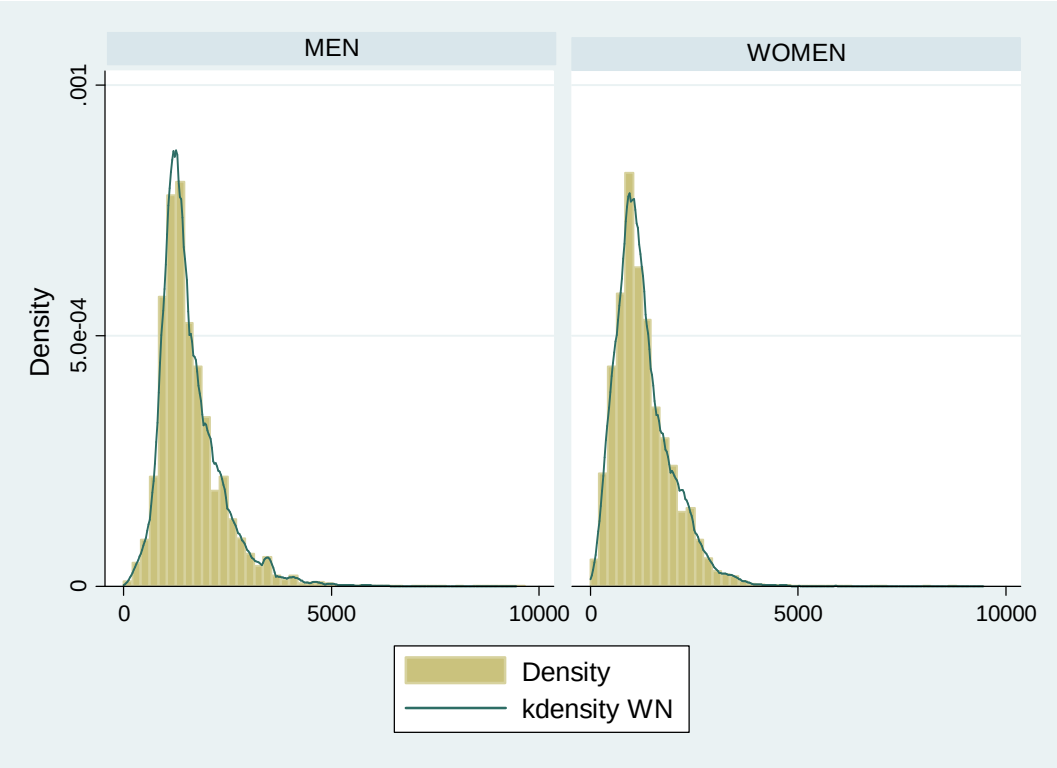

**Table A.3. Quantile salary decomposition. (Source: authors' elaboration based on data from the ECV, pool 2009-2012).**

| | Differences | Sig. | | Endowments | Sig. | | Coefficients | Sig. | | % | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **TOTAL** | | | | | | | | | | | |
| Q1 | -0,465 | 0,000 | *** | -0,292 | 0,000 | *** | -0,172 | 0,000 | *** | **62,9%** | **37,1%** |
| Q2 | -0,333 | 0,000 | *** | -0,147 | 0,000 | *** | -0,186 | 0,000 | *** | **44,2%** | **55,8%** |
| Q3 | -0,268 | 0,000 | *** | -0,090 | 0,000 | *** | -0,177 | 0,000 | *** | **33,8%** | **66,2%** |
| Q4 | -0,228 | 0,000 | *** | -0,061 | 0,000 | *** | -0,167 | 0,000 | *** | **26,7%** | **73,3%** |
| Q5 | -0,200 | 0,000 | *** | -0,041 | 0,000 | *** | -0,159 | 0,000 | *** | **20,7%** | **79,3%** |
| Q6 | -0,180 | 0,000 | *** | -0,028 | 0,000 | *** | -0,152 | 0,000 | *** | **15,6%** | **84,4%** |
| Q7 | -0,163 | 0,000 | *** | -0,019 | 0,000 | *** | -0,144 | 0,000 | *** | **11,4%** | **88,6%** |
| Q8 | -0,147 | 0,000 | *** | -0,014 | 0,001 | *** | -0,132 | 0,000 | *** | **9,9%** | **90,1%** |
| Q9 | -0,146 | 0,000 | *** | -0,018 | 0,001 | *** | -0,128 | 0,000 | *** | **12,5%** | **87,5%** |
| **SERVICIES** | | | | | | | | | | | |
| Q1 | -0,464 | 0,000 | *** | -0,307 | 0,000 | *** | -0,158 | 0,000 | *** | **66,0%** | **34,0%** |
| Q2 | -0,344 | 0,000 | *** | -0,178 | 0,000 | *** | -0,166 | 0,000 | *** | **51,8%** | **48,2%** |
| Q3 | -0,287 | 0,000 | *** | -0,128 | 0,000 | *** | -0,158 | 0,000 | *** | **44,7%** | **55,3%** |
| Q4 | -0,255 | 0,000 | *** | -0,102 | 0,000 | *** | -0,153 | 0,000 | *** | **40,0%** | **60,0%** |
| Q5 | -0,234 | 0,000 | *** | -0,084 | 0,000 | *** | -0,150 | 0,000 | *** | **35,9%** | **64,1%** |
| Q6 | -0,219 | 0,000 | *** | -0,071 | 0,000 | *** | -0,148 | 0,000 | *** | **32,5%** | **67,5%** |
| Q7 | -0,204 | 0,000 | *** | -0,061 | 0,000 | *** | -0,143 | 0,000 | *** | **29,8%** | **70,2%** |
| Q8 | -0,188 | 0,000 | *** | -0,054 | 0,000 | *** | -0,134 | 0,000 | *** | **28,8%** | **71,2%** |
| Q9 | -0,185 | 0,000 | *** | -0,053 | 0,000 | *** | -0,132 | 0,000 | *** | **28,6%** | **71,4%** |
| **Non SERVICIES** | | | | | | | | | | | |
| Q1 | -0,410 | 0,000 | *** | -0,184 | 0,000 | *** | -0,226 | 0,000 | *** | **45,0%** | **55,0%** |
| Q2 | -0,319 | 0,000 | *** | -0,074 | 0,000 | *** | -0,245 | 0,000 | *** | **23,3%** | **76,7%** |
| Q3 | -0,268 | 0,000 | *** | -0,031 | 0,000 | *** | -0,237 | 0,000 | *** | **11,7%** | **88,3%** |
| Q4 | -0,231 | 0,000 | *** | -0,008 | 0,109 | | -0,222 | 0,000 | *** | **3,6%** | **96,4%** |
| Q5 | -0,196 | 0,000 | *** | 0,007 | 0,175 | | -0,204 | 0,000 | *** | **-3,7%** | **103,7%** |
| Q6 | -0,175 | 0,000 | *** | 0,021 | 0,000 | *** | -0,195 | 0,000 | *** | **-11,8%** | **111,8%** |
| Q7 | -0,158 | 0,000 | *** | 0,030 | 0,000 | *** | -0,188 | 0,000 | *** | **-19,3%** | **119,3%** |
| Q8 | -0,148 | 0,000 | *** | 0,033 | 0,001 | *** | -0,181 | 0,000 | *** | **-22,3%** | **122,3%** |
| Q9 | -0,144 | 0,000 | *** | 0,028 | 0,018 | ** | -0,171 | 0,000 | *** | **-19,2%** | **119,2%** |
| **KIS** | | | | | | | | | | | |
| Q1 | -0,353 | 0,000 | *** | -0,175 | 0,000 | *** | -0,178 | 0,000 | *** | **49,4%** | **50,6%** |
| Q2 | -0,265 | 0,000 | *** | -0,106 | 0,000 | *** | -0,159 | 0,000 | *** | **39,9%** | **60,1%** |
| Q3 | -0,227 | 0,000 | *** | -0,081 | 0,000 | *** | -0,147 | 0,000 | *** | **35,5%** | **64,5%** |
| Q4 | -0,207 | 0,000 | *** | -0,070 | 0,000 | *** | -0,137 | 0,000 | *** | **33,7%** | **66,3%** |
| Q5 | -0,191 | 0,000 | *** | -0,063 | 0,000 | *** | -0,129 | 0,000 | *** | **32,8%** | **67,2%** |
| Q6 | -0,178 | 0,000 | *** | -0,057 | 0,000 | *** | -0,121 | 0,000 | *** | **32,1%** | **67,9%** |
| Q7 | -0,167 | 0,000 | *** | -0,054 | 0,000 | *** | -0,113 | 0,000 | *** | **32,3%** | **67,7%** |
| Q8 | -0,163 | 0,000 | *** | -0,052 | 0,000 | *** | -0,111 | 0,000 | *** | **31,8%** | **68,2%** |
| Q9 | -0,169 | 0,000 | *** | -0,054 | 0,000 | *** | -0,115 | 0,000 | *** | **31,8%** | **68,2%** |
| **Non KIS** | | | | | | | | | | | |
| Q1 | -0,498 | 0,000 | *** | -0,421 | 0,000 | *** | -0,077 | 0,000 | *** | **84,6%** | **15,4%** |
| Q2 | -0,410 | 0,000 | *** | -0,280 | 0,000 | *** | -0,129 | 0,000 | *** | **68,5%** | **31,5%** |
| Q3 | -0,337 | 0,000 | *** | -0,190 | 0,000 | *** | -0,147 | 0,000 | *** | **56,5%** | **43,5%** |
| Q4 | -0,302 | 0,000 | *** | -0,151 | 0,000 | *** | -0,151 | 0,000 | *** | **50,0%** | **50,0%** |
| Q5 | -0,284 | 0,000 | *** | -0,125 | 0,000 | *** | -0,160 | 0,000 | *** | **43,9%** | **56,1%** |
| Q6 | -0,278 | 0,000 | *** | -0,116 | 0,000 | *** | -0,162 | 0,000 | *** | **41,6%** | **58,4%** |
| Q7 | -0,280 | 0,000 | *** | -0,117 | 0,000 | *** | -0,163 | 0,000 | *** | **41,7%** | **58,3%** |
| Q8 | -0,298 | 0,000 | *** | -0,122 | 0,000 | *** | -0,177 | 0,000 | *** | **40,8%** | **59,2%** |
| Q9 | -0,343 | 0,000 | *** | -0,136 | 0,000 | *** | -0,207 | 0,000 | *** | **39,7%** | **60,3%** |